

REMARKS

The Examiner is respectfully requested to reconsider the application in view of the above amendments to the claims, following remarks and the attached declaration. Support for the amendments can be found at page 7, lines 7-8, ,lines 13-16, and page 8, lines 12-18.

35 U.S.C. § 103

Claims 1 and 4-6 are rejected under 35 U.S.C. § 103(a) as being obvious over United States Patent No. 4,462,918 (Matthews et al.) in view of European Patent Application No. 0,434,464 (Waters et al.) and United States Patent No. 4,627,928 (Kahn). To the extent not obviated by the above amendments to the claims, the rejection is respectfully traversed for the following reasons.

a) United States Patent No. 6,114,288 to Fujitsu et al. ("Fujitsu"), which the examiner cited in the Examiner's Answer.

The invention is a hydraulic fluid comprising a lubricant base oil in combination with

- (a) from 0.001 to at most 1 %wt of magnesium salicylate,
- (b) from 0.01 to at most 1%wt of zinc dithiophosphate; and,
- (c) from 0.001 to 5 %wt of a compound according to the following formula I



in which R₁ and R₂ are each an alkyl of 3 to 6 carbon atoms; R₃, R₄ and R₅ are each hydrogen; X is N and R₆ and R₇ are each an alkyl of 15 to 20 carbon atoms, or an acyl group derived from a saturated or unsaturated carboxylic acid containing 4 to 10 carbon atoms, at least one of R₆ and R₇ being an acyl group. Applicants have found that the specific combination of components (a), (b), and (c) in certain amount provide improved performance at low load compared with a combination containing calcium salicylate and also provides greater thermal stability and less sludge and deposits formed. As can be seen at Table 1, the comparative composition containing calcium

salicylate (Composition 2) has significantly more ring weight loss and total weight loss than the composition as claimed in the present application containing magnesium salicylate (Composition 1). Further, applicants' claimed formulations contain ash producing compounds such as magnesium salicylate and zinc dithiophosphate. It is unexpected to have a hydraulic fluid comprising low amounts of zinc dithiophosphate ("ZnDTP") anti-wear agent to have good protection against wear. As discussed in the attached Declaration of Dr. Richard Dixon, historically zinc dithiophosphate has been used in large quantity to improve wear resistance.

The Matthews patent deals with the combination of ZnDTP and acidic antirust agent as a means to reduce wear. It makes no mention of the use of salicylates. Dr. Dixon states (page 3) that the wear test in the Matthews patent is run to standard length of 250 hours. Applicants' formulation delivers extended low wear over long period of low load (wear at idle condition) which is unexpected to a skilled person in Dr. Dixon's opinion. As stated by Dr. Dixon (page 3), applicants' claimed formulation that shows constant wear over 1000 hours and at low load condition is unexpected for a person skilled in the art. The key difference with Matthews teaching is that the Application utilizes Magnesium salicylate to deliver the extended low wear over long period of low load.

The Waters patent aims at the formulation of ashless (metal-free) hydraulic fluids. As stated by Dr. Richard Dixon (page 4), in an ashless formulation, by definition, there are no metals to leave ash after burning and a person skilled in the art in his opinion will not look for a solution of an ash-containing formulation from an ashless formulation. According to Dr. Dixon there are different industry requirements and chemistry involved between ashless and ash-containing formulation.

In the abstract, Waters states:

Lubricant compositions especially useful as hydraulic fluids contain a metal-free anti-wear or loadcarrying additive containing sulphur and/or phosphorus and an amino succinate ester as corrosion inhibitor. Such compositions are free from heavy metals and have improved environmental acceptability where heavy metals are to be avoided . . .(emphasis added).

Clearly Waters teach a zinc-free (ZnDTP-free) and ashless formulation.
(page 2, lines 7-9 and line 18 and line 39)

... as an antiwear additive, a zinc dialkyl dithiophosphate (a so-called "ZDDP"). It is desirable to be able to provide hydraulic fluids which are zinc free. (emphasis added).

Hydraulic fluids incorporating ZDDPs do not always give the required performance in the FZG test.

The metal free, and preferably ashless, anti-wear or load carrying additive may be any one of a wide range of sulphur-and/or phosphorus-containing additives, . . . (emphasis added).

By contrast Applicants formulation is an ash-containing formulation that contains ash producing compounds such as magnesium salicylate and zinc dithiophosphate. According to Dr. Dixon (page 4), a skilled person would readily understand that a ashless hydraulic fluids formulations such as Waters are significantly different from the applicants formulation containing ash producing metals.

The Karn patent relates to basic magnesium salts of substituted aromatic hydroxyl carboxylic acids or the derivatives thereof and to a process for preparing such salts. (see abstract) In column 1, lines 39-41 state that "magnesium salts either alone or in combination as , e.g. dispersants, detergents or antioxidants in oils or fuels, etc with other known additives." The reference does not mention wear performance improvements or antiwear agents but is directed to use as dispersants. Karn patent states at column 2, lines 22-26:

It is the object of this invention to provide basic magnesium salts of alkylated aromatic hydroxyl-containing carboxylic acids, e.g., alkyl-substituted hydroxyl benzoic acids, which can be used as dispersants with oxidation-inhibiting characteristics in various lubricating oils and fuels. (emphasis added).

In Dr. Dixon's opinion (page 4), a skilled person would understand that this patent deals with fuel and lubricant additives in general and is not directed to hydraulic fluids or to wear performance.

Based on all of the foregoing, it is submitted that the instantly claimed invention would not have been obvious to a skilled person obvious over Matthews in

view of Waters and Kahn. In Dr. Dixon's opinion (page 4), a skilled person would understand the significance of a low ZnDTP formulation having good extended low wear over long period of low load as can be seen at Table 1 composition 1 as claimed in the present application. Applicants have found that the specific combination of components (a), (b), and (c) in certain amount provide good wear performance at low load and also provides greater thermal stability and less sludge and deposits formed. Applicants believe that the claims as amended are supported by evidence of non-obviousness as discussed above.

Claims 1 and 4-6 are rejected under 35 U.S.C. § 103(a) as being obvious over United States Patent No. 6,114,288 (Fujitsu et al.) in view of United States Patent No. 4,462,918 (Matthews et al.) To the extent not obviated by the above amendments to the claims, the rejection is respectfully traversed for the following reasons.

The Fujitsu patent deals with lubricating oil for internal combustion engines as stated in the title. According to Dr. Dixon (page 5), a skilled person would understand that it is not relevant to hydraulics and such teachings can not be translated to hydraulic fluids. Dr. Dixon states at page 5 that:

Fujitsu is targeted at the moving valve parts in four-stroke engines, specifically mentioning cam-and-tappet contact. The tests described in this patent are for "appraising the quality and performance of lubricating oils for internal combustion engines" and does not translate to hydraulic pumps.

In column 2, line 55 the Fujitsu reference states:

We have found a lubricating oil for internal combustion engines which overcomes the problem of scuffing and wear resistance of moving valve parts under the above mentioned severe lubrication conditions.

According to Dr. Dixon, a skilled person would understand that this has nothing to do with hydraulic system wear where scuffing is not a common issue. In addition, Fujitsu uses larger amounts of alkyl salicylates.

The Matthews patent is discussed above.

Based on all of the foregoing, it is submitted that the instantly claimed invention would not have been obvious to a skilled person obvious over Fujitsu in view of Matthews. In Dr. Dixon's opinion (page 5), it is unexpected that hydraulic fluid comprising a lubricant base oil in combination with

- (d) from 0.001 to at most 1 %wt of magnesium salicylate,
- (e) from 0.01 to at most 1%wt of zinc dithiophosphate; and,
- (f) from 0.001 to 5 %wt of a compound according to the following formula I



in which R₁ and R₂ are each an alkyl of 3 to 6 carbon atoms; R₃, R₄ and R₅ are each hydrogen; X is N and R₆ and R₇ are each an alkyl of 15 to 20 carbon atoms, or an acyl group derived from a saturated or unsaturated carboxylic acid containing 4 to 10 carbon atoms, at least one of R₆ and R₇ being an acyl group, deliver extended low wear over long period of low load. Applicants believe that the claims as amended are supported by evidence of non-obviousness as discussed above.

Accordingly, Applicants respectfully request withdrawal of the 103 rejection.

The Examiner is respectfully requested to reexamine the claims and pass the case to issue. If it would be considered helpful in resolving any issues in the case, the Examiner is encouraged to contact the undersigned at the number below.

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